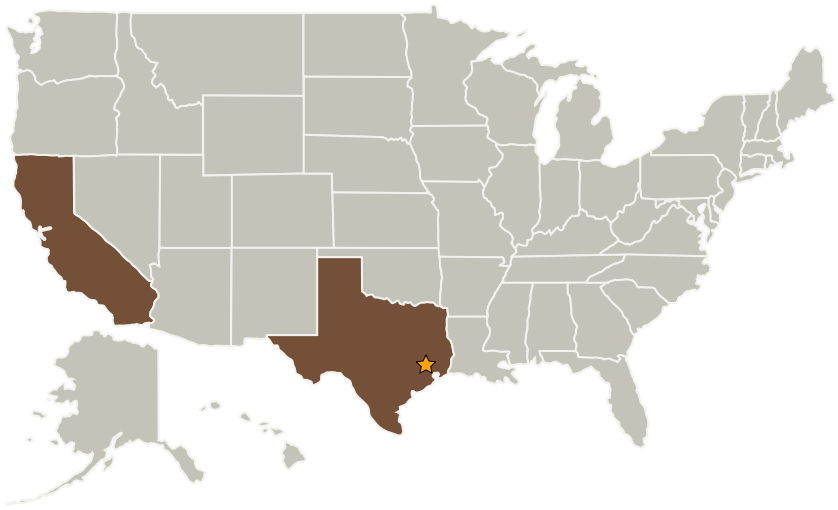
Adaptive Intelligent Ventilation Noise Control, Phase II

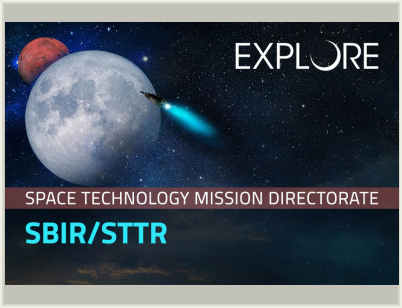
Completed Technology Project (2006 - 2008)

Project Introduction

To address the NASA need for quiet on-orbit crew quarters (CQ), Physical Optics Corporation (POC) proposes to develop a new Adaptive Intelligent Ventilation Noise Control (AIVNC) system to reduce acoustic noise inside the CQ and work spaces. AIVNC is based on a new multimodal, skin-like active noise controller that will be easy to retrofit and will not interfere with air flow or generate secondary noise. AIVNC cancels ventilation noise by producing high fidelity, broadband counter-acoustic energy by means of very thin, flat multifrequency active patches under the control of an intelligent adapting module (IAM) based on a spontaneous adapting acoustic model. In Phase I POC demonstrated AIVNC with in-duct streamlined MAPs based on two piezoelectric materials, reproducing high-quality sound at up to 90 dB from 300 to 10000 Hz with very low distortion; a compact driving MAP amplifier; two IAM algorithms predicting ventilation noise one step ahead to cancel it, reducing noise by up to 27 dB rms with real ISS ventilation noise provided by NASA. In Phase II POC will advance/optimize AIVNC components to build a fully functional AIVNC prototype to reduce CQ noise by >30 dB, satisfying NC 40 requirements for NASA crew quarters.

Primary U.S. Work Locations and Key Partners





Adaptive Intelligent Ventilation Noise Control, Phase II

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

Adaptive Intelligent Ventilation Noise Control, Phase II

Completed Technology Project (2006 - 2008)

Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Physical Optics Corporation	Supporting Organization	Industry	Torrance, California

Primary U.S. Work Locations	
California	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX15 Flight Vehicle Systems
  - TX15.1 Aerosciences
    - TX15.1.4 Aeroacoustics